

Office Action Summary	Application No.	Applicant(s)	
	10/810,756	HU ET AL.	
	Examiner	Art Unit	
	Navneet K. Ahluwalia	2166	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27, 29-36 and 38-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27, 29-36 and 38-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is in response to the Amendment filed 06/07/2007.

Response to Arguments

2. Claims 1 – 27, 29 – 36 and 38 – 47 are pending in this Office Action. After a further search and a thorough examination of the present application, claims 1 – 27, 29 – 36 and 38 – 47 remain rejected.
3. Applicant's arguments with respect to claims 1 – 27, 29 – 36 and 38 – 47 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1 – 27, 29 – 36 and 38 – 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozbutun et al. ('Ozbutun' herein after) (US 6,067,540) further in view of Brown et al. ('Brown' herein after) (US 6,026,398).

With respect to claim 1.

Ozbutun discloses a database management system having the improvement comprising: bitmap values, a bitmap value having a representation of a bitstring wherein set bits specify a set of objects whose definitions are built into the database management system, bitmap operations provided by the database system, a bitmap operation having user specified operands which are bitmap values and/or set of objects (Figure 3A, column 5 lines 58 – 67 and column 6 lines 20 – 26 and column 7 lines 4 – 31, Ozbutun).

Ozbutun does not explicitly disclose the operands as claimed.

Brown however teaches the operands as claimed (column 14 lines 36 – 58, Brown).

It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because both inventions are directed towards the same field of invention, namely bitmap indexing for better database processing results. The operands and functionalities described in Brown would make Ozbutun's system more efficient and user-friendly

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(abstract, Brown):

With respect to claim 2.

Ozbutun as modified discloses the database management system set forth in claim 1 wherein the bitmap operations comprise at least: a set-to-bitmap operation wherein a bitmap value is derived from a set of the objects specified in an operand (column 5 lines 41 – 57, Ozbutun).

With respect to claim 3.

Ozbutun as modified discloses the database management system set forth in claim 2 wherein: the derived bitmap value is a new bitmap value that specifies the objects in the specified set (column 5 lines 41 – 57, Ozbutun).

With respect to claim 4.

Ozbutun as modified discloses the database management system set forth in claim 2 wherein: the derived bitmap value is a preexisting bitmap value which now further specifies the objects in the specified set (column 5 lines 41 – 57, Ozbutun).

With respect to claim 5.

Ozbutun as modified discloses the database management system set forth in claim 2 wherein: the derived bitmap value is a preexisting bitmap value which now no longer specifies any objects in the specified set (column 5 lines 41 – 57, Ozbutun).

With respect to claim 6.

Ozbutun as modified discloses the database management system set forth in claim 1 wherein the bitmap operations comprise at least: a bitmap-to-set operation wherein the set of objects specified in a bitmap value specified in an operand is derived from the specified bitmap value (column 5 lines 41 – 57, Ozbutun).

With respect to claim 7.

Ozbutun as modified discloses the database management system set forth in claim 1 wherein the bitmap operations comprise at least: a bitmap-to-count operation wherein the number of the objects in the set specified in a bitmap value specified in an operand is derived from the specified bitmap value (column 2 lines 53 – 67, Ozbutun).

With respect to claim 8.

Ozbutun as modified discloses the database management system set forth in claim 1 wherein the bitmap operations comprise at least: an existence operation wherein a value representing the logical value TRUE is returned when a object specified in an operand belongs to the set of the objects represented by a bitmap value specified in another operand (column 7 lines 20 – 32, Ozbutun).

With respect to claim 9.

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Ozbutun as modified discloses the database management system set forth in claim 1 wherein the bitmap operations comprise at least: a logical operation on a first bitstring from a first bitmap value and a second bitstring from a second bitmap value specified in another operand (column 7 lines 20 – 32, Ozbutun).

With respect to claim 10.

Ozbutun as modified discloses the database management system set forth in claim 1 wherein the bitmap operations comprise at least: a comparison operation on a first bitmap value specified in an operand and a second bitmap value specified in another operand wherein a value representing the logical value TRUE is returned when the first bitmap value and the second bitmap value specify the same set of objects (column 7 lines 20 – 32, Ozbutun).

With respect to claim 11.

Ozbutun as modified discloses the database management system set forth in claim 1 wherein: the bitmap values include settable bitmap values; and the bitmap operations comprise at least an assignment operation which sets a target settable bitmap value specified in an operand from a source bitmap value specified in another operand (column 6 lines 8 – 19, Ozbutun).

With respect to claim 12.

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Ozbutun as modified discloses the database management system set forth in claim 1 wherein: the bitmap values include bitmap values that are persistent in the database management system (Figure 2, Ozbutun).

With respect to claim 13.

Ozbutun as modified discloses the database management system set forth in claim 12 wherein: the persistent bitmap values include bitmap values in user-specified fields of tables of the database management system (Figure 2, Ozbutun).

With respect to claim 14.

Ozbutun as modified discloses the database management system set forth in claim 1 wherein: the bitstring in the bitmap value is compressed (column 5 lines 37 – 57, Ozbutun).

With respect to claim 15.

Ozbutun as modified discloses the database management system set forth in claim 1 wherein: the objects are identifiers for other objects that exist in the database management system (column 6 lines 8 – 19, Ozbutun).

With respect to claim 16.

Ozbutun as modified discloses the database management system set forth in claim 15 wherein: the identifiers for the other objects are row identifiers of rows in the

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database management system (column 6 lines 8 – 19, Ozbutun).

With respect to claim 17.

Ozbutun as modified discloses the database management system set forth in claim 16 wherein: the row identifiers are row identifiers returned by a user-defined query executed in the database management system (column 7 lines 4 – 19, Ozbutun).

With respect to claim 18.

Ozbutun as modified discloses the database management system set forth in claim 17 wherein: the query returns a row identifier when a field in the row has an attribute specified in the query, whereby the bitmap value represents the set of fields having the specified attribute (column 6 lines 8 – 19, Ozbutun).

With respect to claim 19.

Ozbutun as modified discloses the database management system set forth in claim 1 wherein: the objects are identifiers for other objects that exist outside the database management system (column 7 lines 4 – 19, Ozbutun).

With respect to claim 20.

Ozbutun as modified discloses the database management system set forth in claim 19 wherein: the identifiers for objects that exist outside the database management system are electronic product codes for product items (column 7 lines 4 – 19, Ozbutun).

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With respect to claim 21.

Ozbutun as modified discloses the data storage device, the data storage device being characterized in that: the data storage device contains code which, when executed in a computer system, implements the database management system set forth in claim 1 (Figure 3A, column 5 lines 58 – 67 and column 6 lines 20 – 26 and column 7 lines 4 – 31, Ozbutun).

Ozbutun does not explicitly disclose the operands as claimed.

Brown however teaches the operands as claimed (column 14 lines 36 – 58, Brown).

It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because both inventions are directed towards the same field of invention, namely bitmap indexing for better database processing results. The operands and functionalities described in Brown would make Ozbutun's system more efficient and user-friendly (abstract, Brown).

With respect to claim 22.

Ozbutun discloses the bitmap value employed in a database management system, the bitmap value representing a first subset of a second subset of objects that are defined in the database management system and the bitmap value comprising: a mapping specifier that maps a string of bits to the second subset; and a representation

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of the string of bits wherein a bit is set in the represented string of bits when the member of the second subset that is mapped to the bit belongs to the first subset and database management system providing at least a first operation which permit users of the database system to specify the mapping of the string of bits to the second subset and a second operation which permits users to directly specify setting bits of the string of bits that correspond to the first subset (Figure 3A, column 5 lines 58 – 67 and column 6 lines 20 – 26 and column 7 lines 4 – 31, Ozbutun).

Ozbutun does not explicitly disclose the operands as claimed.

Brown however teaches the operands as claimed (column 14 lines 36 – 58, Brown).

It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because both inventions are directed towards the same field of invention, namely bitmap indexing for better database processing results. The operands and functionalities described in Brown would make Ozbutun's system more efficient and user-friendly (abstract, Brown).

With respect to claim 23.

Ozbutun as modified discloses the bitmap value set forth in claim 22 wherein: the second set is ordered (column 5 lines 41 – 57, Ozbutun).

With respect to claim 24.

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Ozbutun as modified discloses the bitmap value set forth in claim 23 wherein: the order of the objects corresponds to values of the objects; the mapping specifier specifies the mapping by specifying one or more ranges of the values of the objects to which the string of bits is mapped; and the representation of the string of bits represents strings of bits corresponding to the ranges (column 5 lines 41 – 57, Ozbutun).

With respect to claim 25.

Ozbutun as modified discloses the bitmap value set forth in claim 24 wherein: the mapping specifier specifies the range of the values by specifying a start value and an end value (column 5 lines 41 – 57, Ozbutun).

With respect to claim 26.

Ozbutun as modified discloses the bitmap value set forth in claim 24 wherein: the values include a prefix which determines a range of the values; and the mapping specifier specifies the range of the values by specifying the prefix for the range (column 5 lines 41 – 57, Ozbutun).

With respect to claim 27.

Ozbutun as modified discloses the bitmap value set forth in claim 26 wherein: the mapping specifier further specifies the range of the values by using a start value and an end value to specify one or more subranges of the range specified by the prefix (column 5 lines 41 – 57, Ozbutun).

With respect to claim 29.

Ozbutun as modified discloses the bitmap value set forth in claim 28 wherein: the objects are electronic product codes (column 2 lines 53 – 67, Ozbutun).

With respect to claim 30.

Ozbutun as modified discloses the bitmap value set forth in claim 22 wherein: there is a plurality of the bitmap values in the database management system; and certain of the bitmap values are persistent in the database management system (column 2 lines 53 – 67, Ozbutun).

With respect to claim 31.

Ozbutun as modified discloses the bitmap values set forth in claim 30 wherein: the persistent bitmap values include bitmap values in user-specified fields of tables of the database management system (column 7 lines 20 – 32, Ozbutun).

With respect to claim 32.

Ozbutun as modified discloses the bitmap value set forth in claim 22 wherein: the representation of the bitstring is a compressed representation thereof (column 7 lines 20 – 32, Ozbutun).

With respect to claim 33.

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Ozbutun as modified discloses the bitmap value set forth in claim 22 wherein: there is a plurality of the bitmap values in the database management system; and the database management system provides further bitmap operations on the bitmap values (column 6 lines 8 – 19, Ozbutun).

With respect to claim 34.

Ozbutun as modified discloses the bitmap value set forth in claim 33 wherein: certain of the bitmap operations alter the range specifier and the representation of the bitstring as required to map the represented string of bits to a second subset of the second set that is required for the operation (figure 2 and column 5 lines 37 – 57, Ozbutun).

With respect to claim 35.

Ozbutun as modified discloses the data storage device, the data storage device being characterized in that: the data storage device contains code which, when executed in a computer system, implements the bitmap value set forth in claim 22 (Figure 3A, column 5 lines 58 – 67 and column 6 lines 20 – 26 and column 7 lines 4 – 31, Ozbutun).

Ozbutun does not explicitly disclose the operands as claimed.

Brown however teaches the operands as claimed (column 14 lines 36 – 58, Brown).

It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because both inventions are directed towards the same field of invention, namely bitmap indexing for better database processing results. The operands and functionalities described in Brown would make Ozbutun's system more efficient and user-friendly (abstract, Brown).

With respect to claim 36.

Ozbutun discloses the method employed in a database system of making a bitmap value that represents a first subset of a second subset of objects that are defined in the database management system, the method comprising the steps performed in the database system of: performing a first operation provided by the database system to users of the system, the first operation mapping a bitstring that is represented in the bitmap value onto the second subset and performing a second such operation, the second operation setting the bits in the bitstring that correspond to the first subset (Figure 3A, column 5 lines 58 – 67 and column 6 lines 20 – 26 and column 7 lines 4 – 31, Ozbutun).

Ozbutun does not explicitly disclose the operands as claimed.

Brown however teaches the operands as claimed (column 14 lines 36 – 58, Brown).

It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because

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both inventions are directed towards the same field of invention, namely bitmap indexing for better database processing results. The operands and functionalities described in Brown would make Ozbutun's system more efficient and user-friendly (abstract, Brown).

With respect to claim 38.

Ozbutun as modified discloses the method set forth in claim 37 wherein: the objects are electronic product codes (column 7 lines 4 – 19, Ozbutun).

With respect to claim 39.

Ozbutun as modified discloses the method set forth in claim 36 wherein the objects are ordered and the step performing the first operation comprises the steps of: making a range specifier that specifies a range of the objects; and mapping the bits in the bitstring to the specified range (column 6 lines 8 – 19, Ozbutun).

With respect to claim 40.

Ozbutun as modified discloses the method set forth in claim 39 wherein the step of making a range specifier includes the step of: making a start value and an end value which together specify the range (column 7 lines 4 – 19, Ozbutun).

With respect to claim 41.

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Ozbutun as modified discloses the method set forth in claim 39 wherein the step of making a range specifier includes the step of making a prefix value which specifies the range (column 6 lines 8 – 19, Ozbutun).

With respect to claim 42.

Ozbutun as modified discloses the method set forth in claim 36 further comprising the step of: compressing the bitstring (column 5 lines 37 – 57, Ozbutun).

With respect to claim 43.

Ozbutun as modified discloses the data storage device, the data storage device being characterized in that: the data storage device contains code which, when executed in a computer system, implements the method set forth in claim 36 (Figure 3A, column 5 lines 58 – 67 and column 6 lines 20 – 26 and column 7 lines 4 – 31, Ozbutun).

Ozbutun does not explicitly disclose the operands as claimed.

Brown however teaches the operands as claimed (column 14 lines 36 – 58, Brown).

It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because both inventions are directed towards the same field of invention, namely bitmap indexing for better database processing results. The operands and functionalities described in Brown would make Ozbutun's system more efficient and user-friendly (abstract, Brown).

With respect to claim 44.

Ozbutun discloses the bitmap value employed in a database management system to represent a first subset of the row identifiers defined in the database management system, the bitmap value comprising: a mapping specifier that maps a string of bits to a second subset of the set of row identifiers, the second subset including the first subset; and a representation of the string of bits wherein a bit is set in the represented string of bits when the member of the second subset that is mapped to the bit corresponds to a member of the first subset, the database management system providing at least a first operation which permits users of the database system to directly specify the mapping of the string of bits to the second subset and a second operation that permits users of the database system to directly specify setting bits of the string of bits that correspond to the first subset; and the first subset is returned by a user-defined query executed by the database management system (Figure 3A, column 5 lines 58 – 67 and column 6 lines 20 – 26 and column 7 lines 4 – 31, Ozbutun).

Ozbutun does not explicitly disclose the operands as claimed.

Brown however teaches the operands as claimed (column 14 lines 36 – 58, Brown).

It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because both inventions are directed towards the same field of invention, namely bitmap indexing for better database processing results. The operands and functionalities

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described in Brown would make Ozbutun's system more efficient and user-friendly (abstract, Brown).

With respect to claim 45.

Ozbutun as modified discloses the bitmap value set forth in claim 44 wherein: the first operation dynamically alters the mapping specifier such that the string of bits is mapped to a second subset includes the first subset (column 7 lines 4 – 19, Ozbutun).

With respect to claim 46.

Ozbutun as modified discloses the bitmap value set forth in claim 44 wherein: the first subset is returned by a query which returns a row identifier when a field identified by the row identifier has an attribute specified in the query, whereby the bitmap value represents the set of fields whose values have the specified attribute (column 5 lines 37 – 57, Ozbutun).

With respect to claim 47.

Ozbutun as modified discloses the data storage device, the data storage device being characterized in that: the data storage device contains code which, when executed in a computer system, implements the method set forth in claim 44 (Figure 3A, column 5 lines 58 – 67 and column 6 lines 20 – 26 and column 7 lines 4 – 31, Ozbutun).

Ozbutun does not explicitly disclose the operands as claimed.

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Brown however teaches the operands as claimed (column 14 lines 36 – 58, Brown).

It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because both inventions are directed towards the same field of invention, namely bitmap indexing for better database processing results. The operands and functionalities described in Brown would make Ozbutun's system more efficient and user-friendly (abstract, Brown).

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Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Navneet K. Ahluwalia whose telephone number is 571-272-5636.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alam T. Hosain can be reached on 571-272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Navneet

Navneet K. Ahluwalia
Examiner
Art Unit 2166

Dated: 09/15/2007

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